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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/554,041	10/12/2000	Martin Lenfers	10191/1376	5483

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EXAMINER

OLSEN, KAJ K

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 09/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/554,041

Applicant(s)

LENFERS ET AL.

Examiner

Kaj Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 July 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other:  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 6-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.
2. The claims are drawn to a probe for determining an oxygen concentration in a gas mixture. In particular, the claims call for a "loaded voltage divider including a plurality of resistors that are arranged such that a negative feedback of a Nernst voltage circuit and of a pump voltage circuit is optimized" (claim 6). The term "negative feedback" as it is conventional understood implies that the output of an amplification stage is fed back into an input of said amplification stage in such a manner that the overall gain of the amplification stage is reduced (see enclosed discussion in Diefenderfer). However, all the applicant has shown in the specification is a configuration of resistors that connect the inner pumping electrode to the Nernst electrode and does not appear to have described anything about the Nernst voltage or pump voltage circuitry which apparently utilizes this configuration to achieve negative feedback. What constitutes the amplification inputs and outputs and how does this configuration of resistors optimize this feedback? Furthermore, what constitutes an "optimized" or "maximized" feedback for the Nernst voltage circuit or pump voltage circuit? The specification is not

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enabling to one possessing ordinary skill in the art concerning these issues. Consequently, one of ordinary skill in the art at the time the invention was being made would not be enabled to make and use the instant invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. In claims 6 and 7, it is still unclear what constitutes an "optimized" or "maximized" feedback. Applicant's further discussion of the invention has not sufficiently elucidated what the metes and bounds of these terms are. Applicant urged that "optimized" and "maximized" referred to setting the negative feedback to an "upper limit" such that a current is above a "minimum pump current". However, as discussed above, the examiner cannot discern any clear meaning of any of these terms from the original filed disclosure nor from the applicant's arguments (see fuller discussion below)

6. In addition, it is unclear how to interpret the "maximized" of claim 7 as it depends from claim 6 which utilized "optimized". In applicant's own discussion, they urged that increasing the negative feedback reduced the ripple about  $\lambda=1$ , but the continued increase in negative feedback eventually caused the pump current to reduce below a minimum pump current. To avoid that, applicant imposed an upper limit on the feedback (paragraph bridging pp. 4 and 5 of applicant's response of paper 15). However, claim 7 merely instructs maximizing the feedback even though applicant has argued in their response that one shouldn't maximize the feedback

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because it causes the pump current to fall below a certain minimum level. Hence, it is entirely unclear how to interpret claim 7's requirement for a "maximized" feedback when their discussion teaches against doing so. Moreover, how is claim 7's "maximized" meant to be interpreted when claim 6 recites that the feedback should be "optimized" instead. The term "optimized" clearly has different scope and meaning than "maximized", and "maximized" would not appear to fall within the metes and bounds of "optimized".

### ***Response to Arguments***

7. Applicant's arguments filed 6-30-2003 have been fully considered but they are not persuasive. Applicant further addresses the examiner's concerns about the enablement of the various claim terms (in particular, "loaded voltage divider" and "negative feedback").

8. With respect to the term "loaded voltage divider", applicant's explanation was persuasive and the examiner will withdraw the specific enablement rejection concerning the use of that term. However, the examiner was confused by a couple of comments the applicant made. First, on page 2 of the applicant's response, applicant urges that the examiner has argued that contact point 52 is connected to ground. The examiner never suggested this. Rather the examiner was inquiring whether contact point 34 (or 34') would be connected to ground (see p. 3, lines 2-6 of the examiner's previous office action (paper no. 16)). Furthermore, applicant's comments on page 3 of the response that "[v]iewing point 34 of Figure 32 as ground" would appear to suggest that the previous "52" was a misprint, but clarification is requested. Second, applicant urges on page 3 of the response that the voltage at the Nernst *reference* electrode can be expressed by the given equation. It would appear the applicant meant "Nernst electrode" as the Nernst reference

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electrode 18 is not connected to the network of resistors and would not have the specified voltage. The examiner will interpret the discussion as such, but again requests clarification.

9. With respect to the term “negative feedback”, the applicant’s explanation does not clear up the confusion over that term. In particular, applicant urges that increasing the resistance  $R_3$  increases the negative feedback at the minus (i.e. negative) terminal of the amplifier. First, it is unclear how  $R_3$  affects the negative terminal of the amplifier because the Nernst electrode is not connected to the negative terminal; rather the reference electrode is (see figure 4). Even if the examiner were to assume that he was incorrect in his interpretation of which Nernst electrode the applicant was referring to above (i.e. applicant actually did mean to refer to the Nernst reference electrode and not the Nernst electrode), then it would be entirely unclear why the Nernst reference electrode would have the specified voltage of the equation on page 3 of the applicant’s response, because the reference electrode is not connected to any of those resistors specified. Second, it is still unclear what the “negative feedback” is referring to. The term “negative feedback” implies that some output is feedback into some input to reduce the magnitude of the output (see Diefenderfer). Even if the examiner were to accept that an increase in  $R_3$  affects the voltage eventually applied to the negative terminal of the amplifier, how does that constitute an increase in negative feedback? What is the output and input, and how is that output being negatively fed back into the input? This still is not clear from the applicant’s discussion or from the applicant’s disclosure.

10. With respect to the term “optimized”, applicant’s discussion does clear up the concerns with this term at all. It is still entirely unclear what would constitute an optimized feedback both because it is unclear what the feedback even is (see discussion above) and because the applicant

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still has not clarified what would constitute an optimized level of feedback. Applicant's attempts to clarify the use of the term only highlight the vagueness of the current use of this term. In particular, applicant states on the paragraph bridging pp. 3 and 4 of the response that the resistance values are optimized to reduce the rippling effect, to maintain a sufficient pump current, and to produce a correct calibration between anodic and cathodic current. First, the examiner points out that this qualification of what constitutes an optimized feedback are not in the claims or in the original specification. Currently, claim 6 only requires the feedback to be vaguely optimized without any clarification what property is being optimized. Second, what constitutes a "sufficient" pump current? Is this the same thing as the "minimum pump current", which the examiner also does not understand (see discussion that follows)? Third, it would appear from the applicant's discussion that reducing the rippling effect (A), maintaining pump current (B), and producing the correct calibration (C) all interplay off each other. In other words, if too much weight is given to condition A, conditions B and C might suffer. Similarly, if too much weight is given to either condition B (or C), conditions A and C (or A and B) might suffer. Hence, applicant's optimization would appear to be a balancing the relative weight of the various conditions A, B and C (currently all unclaimed). The problem is that the applicant's optimization would appear to be completely relative. If one valued a reduced rippling effect more than the final magnitude of the pump current, then one's own "optimization" would weigh condition A more than conditions B and C. In other words, whether one reached an optimization depends on what they would consider to be an optimized condition. This would be like someone claiming an "optimized temperature" for a process. Unless the disclosure and/or the prior art is entirely clear about what constitutes an optimized temperature for that process, one possessing

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ordinary skill in the art would not be enabled to practice that invention because the optimization temperature would be arbitrary and relative. The applicants of the present invention wish to reduce the ripple effect as much as possible without allowing the pump current to fall below a certain level (again none of these qualifiers are being claimed). However, applicant has never defined what a sufficient (or minimum) pump current would be (either specifically or generally) so one possessing ordinary skill in the art would not be enabled as to what the optimized feedback would be.

11. Applicant also attempts to address the examiner's concern about what the minimum pump current when the pump current is also a function of the gas concentration itself (see paragraph 5 from the previous office action (paper no. 16)). In particular, applicant urges that the pump current depends on the oxygen concentration as detected by the measuring cell. That was precisely the examiner's point. The magnitude of the pump current that flows depends on the gas concentration. Whether that gas concentration is first measured by the measurement cell is irrelevant. The pump current ultimately varies as a function of the gas concentration. Given that fact, how can the applicant refer to a particular minimum pump current without giving any consideration of the particular gas concentration? Applicant has not addressed this fundamental question.

12. With respect to the rejection of the terms "optimized" and "maximized" under 35 U.S.C. 112, second paragraph, applicant urges that the specification makes clear that optimizing and maximizing refers to the optimizing and maximizing the effectiveness of the voltage divider arrangement to reducing the ripple at  $\lambda=1$ . First, the claims do not specify anything about the voltage ripple. Rather the claims merely state that the negative feedback is optimized or



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maximized absent any further clarification or qualifiers. Second, as the examiner pointed out above, even if the examiner were to interpret "optimized" in such a manner, it still appears that the applicant's optimization is a relative concept where the ripple is reduced to a particular level that does not cause the pump current to fall below a certain "sufficient" or "minimum" level.

Absent any clear understanding of what constitutes a sufficient or minimum current, the terms "optimized" and "maximized" remain unclear. In addition, the examiner does not believe the applicant has ever appropriately responded to the examiner concern about having the term "maximized" (from claim 7) further limit the term "optimized" (from claim 6). A maximized feedback would appear to be a feedback that is at its highest value (how else can this term be interpreted?). However, the applicant has stated many times previously that feedback can only be increased to a particular level before the current drops below a "sufficient" or "minimum" level. Hence a maximized feedback would not be an optimized feedback. In fact, it would be a very unoptimal feedback choice. So how is claim 7 supposed to be interpreted as it depends from claim 6? Clarification is still requested.

### *Conclusion*

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (703) 305-0506. The examiner can normally be reached on Monday through Thursday from 7:00 AM-4:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Mr. Nam Nguyen, can be reached at (703) 308-3322.

When filing a fax in Group 1700, please indicate in the header "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communications with the PTO that are not for entry into the file of this application. This will expedite processing of your papers. The fax number for regular communications is (703) 305-3599 and the fax number for after-final communications is (703) 305-5408.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0661.

  
Kaj K. Olsen  
Patent Examiner  
AU 1753  
August 28, 2003